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ABSTRACT

Some semanticists have argued that technical vocabulary or terminology is extralinguistic and therefore semantically uninteresting. However, no boundary exists in linguistic reality between terminology and ordinary vocabulary. Rather, terminologies and ordinary language exist on a continuum, and terminology is therefore a legitimate field for structural investigation. Evidence for this is found in semantic phenomena (markedness, synonymy, homonymy, and polysemy) in a variety of terminologies (subjects), including Scouting, linguistics, psychology, sociology, philosophy, physics, technology, geography, and meteorology. Terminology offers much for the linguist to analyze and classify, and it is appropriate that linguists participate actively in discussions of the introduction or change of terms in areas of science and culture. (MSE)

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ARE TERMINOLOGIES SEMANTICALLY UNINTERESTING?

One of the chief proponents of structural lexo-semantics is Eugenio Coseriu, and the work he has done in this area is certainly admirable. However, some of the things he has said have met with opposition. For example, in describing his model of lexical fields he insists that everything belonging to terminology should be eliminated at the outset in structural lexicology. His argument is that it is essential to make a distinction between what belongs to linguistic meaning and what belongs to a knowledge of extralinguistic reality, and he then (in Coseriu and Geckeler 1974:140-42) continues as follows:

> The matter of technical vocabulary, of terminology, belongs in this framework. Technical vocabulary is simply a nomenclature and as such not structured on the basis of language but rather on the basis of extralinguistic reality, on the basis of the objects of the discipline in question. Terminology thus presents an objective classification constructed on logical, i.e. exclusive, distinctions: A/ Not-A; e.g. acid / base in chemistry. Linguistic oppositions, on the other hand, are very often inclusive:
>
> [A] Not-A , e.g. [Night] Day
>
> Since in technical usage the words are really the representatives of the 'objects', signification and designation coincide in this case whereas in the domain of the 'natural' language they must necessarily be separated....[1]

Another semanticist, Kurt Baldinger (1980:38) claims that what Coseriu is writing about represents an ideal which scientists and other users of terms try but often fail to uphold. In reality, he says, terminologies make use of ordinary language and many times cannot avoid its implication of polysemy, homonymy, etc.

Which one of these two semanticists is right? Is terminology, like ordinary vocabulary, semantically interesting or is it not? The aim of this paper is to show on the basis of a study of various terminologies (see References) that Baldinger is right and that Coseriu's statements in the above quotation are too sweeping. In fact, he establishes a boundary between terminology and ordinary vocabulary that does not exist in reality. What we have is rather a

1. Coseriu's terms 'signification' and 'designation' correspond to Lyons' terms 'sense' and 'reference'.

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continuum (see fig. 1), where terminologies tend to be nearer to the left pole and ordinary language nearer to the right pole. Actually even Coseriu admits that a certain difference can be made between strict and popular terminologies. However, he explicitly (1973:17) excludes both types in his program for the structural investigation of vocabulary.

Fig. 1. A continuum of lexemes.

I will now discuss the various points in the above quotation from Coseriu and Geckeler 1974 and in that connection also take up the semantic phenomena mentioned by Baldinger, i.e. polysemy, homonymy, etc.

Inclusive distinctions of the type where day can include night, as in I stayed three days in London, are usually called instances of distributional markedness since a particular form can be used both in a specific, marked, sense and in a more general, unmarked, sense (cf. Lyons 1977:305ff). Although such instances are more common in ordinary language, they are often found also in terminologies, especially such as are generally used by a large number of people. For example, in sports the term 'slalom' covers both 'slalom' in a narrow sense and 'giant slalom'. In my special investigation of the terminology of Scouting and Guiding (Jacobson, forthcoming) I have found a large number of such cases, as exemplified by the following list, where the underlined superordinate term to the left of the colon is unmarked in relation to one of the hyponyms enumerated to the right.

Unit: Pack, Troop, Unit
Post: Post, Ship
Guide: Brownie Guide, Guide, Ranger Guide.
Leader: Leader, Assistant Leader
Instructor: Instructor, Occasional Instructor
Den Chief: Den Chief, Webelos Den Chief

A specially complex case of markedness is shown by the term 'Scout' in the British Scout Association. See fig. 2.

Sometimes this type of markedness leads to confusion and has to be clarified by expressions like Den Chiefs (incl. Webelos Den Chiefs) or by printing the unmarked term in italics. However, it can also have the advantage of saving space, as when some American Scout books contain a note saying that in order to avoid needless repetition the term 'Post' includes 'Ship'.

Markedness is an arbitrary phenomenon, and we must not assume on the basis

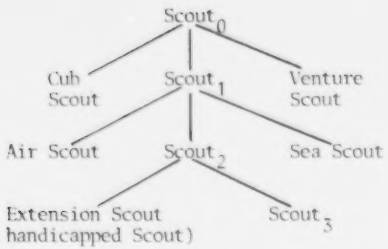

Fig. 2. Three levels at which the British term 'Scout' is used in a marked sense: at the age-group level Scout$_1$ is marked in relation to Scout$_0$, at the spatial program-type level Scout$_2$ is marked in relation to Scout$_1$, and at the physical and/or mental program-type level Scout$_3$ is marked in relation to Scout$_2$.

of the above list, according to which an Assistant Leader is a Leader, that an Assistant Den Chief is also a Den Chief, for this is not the case. Nor is, as will be further discussed later on, a Local Officer in the Salvation Army an Officer.

In the terminology of linguistics markedness is also very common, as illustrated by the following list:

Antonymy: antonymy, complementarity, converseness

Bilingualism: bilingualism, multilingualism

Syntax: syntax, morphology

Generative grammar: generative grammar (in the sense of the more explicit synonym 'Transformational generative grammar'), finite-state grammar, phrase-structure grammar

Lexical field: lexical field, terminological field

Lyons (1981:154-55) finds it difficult to give a straightforward account of oppositeness of sense because of the varying coverage of the key term 'antonymy', which can be both more general (it can also include non-binary contrast and more specific (as in Ljung 1974:84) than in the marked and unmarked senses given above. Lyons himself, however, explicitly creates a case of markedness when he says (1981:281), "henceforth I will use 'bilingualism' to cover multilingualism as well". Trampe-Viberg 1972 includes on p. 102 morphology within 'syntax' but nevertheless speaks on p. 136 of syntax and morphology as different levels of description.

In psychology, sociology, and philosophy there are cases of markedness like

Dextrality: dextrality, sinistrality

Libido: libido (= sexual impulse), other vital impulse

Polygamy: polygamy (synonymous with 'polygyny'), polyandry

Metaphysics: metaphysics (synonymous with 'ontology'), epistemology.

The unmarked term 'dextrality' is commented on as follows by Drever 1964: "sometimes used more generally for sidedness and even inclusive of sinistrality." This use can be due to ignorance of the etymology of the terms. The markedness of 'polygamy' is pointed out both by Mitchell 1968 and NID3.

When Coseriu gives day as an example showing that words can be inclusive in ordinary language but not in science, he has chosen an unfortunate case, for in meteorology a 'rain day' is defined as a period of 24 hours in which at least 0.2 mm rain is recorded, and in astronomy a 'solar day' also comprises 24 hours. Moreover, each of the two terms 'acid' and 'base' that he adduces to show that scientific lexemes are exclusive can be used in both an unmarked and a marked sense. In their unmarked sense 'acid' and 'base' cover both compound molecules and ions. In their marked sense the terms refer only to compound molecules.

In physics 'electron' denotes a negatively charged particle but Collocott-Dobson 1974 says that "the term electron is sometimes used generically to cover both electrons and positrons". In the ISO Nuclear Energy Glossary 1972 (International Standard 921) a similar statement is made. Since this markedness can lead to confusion, the term 'negatron' has been introduced as a synonym of 'electron' in the marked sense. In engineering a 'ball race' denotes the inner or outer steel ring of a ball-bearing. However, it is often used in an unmarked sense for the whole ball-bearing. In statistics 'average' is usually synonymous with 'arithmetic mean' but is sometimes used in an unmarked sense to cover also 'mode' and 'median'. Finally, in medicine 'cortex' has an unmarked sense where it refers to the outer layer of any organ and a marked sense where it is used only about the outer layer of grey matter of the brain.

Markedness is in some cases due to different opinions as to whether two terms are synonymous or whether one is a hyponym of the other. For example, the semantic term 'antonymy' is in the unmarked sense in the list given above a synonym of 'oppositeness of sense' but a hyponym of the latter in the marked sense. Markedness can also be a way of avoiding a lexical gap. For example, a terminological field is a type of lexical field since it consists of lexemes. However, there is no special term for a lexical field consisting of ordinary lexemes, and to cover this meaning 'lexical field' is used in a marked sense, e.g. by Coseriu, who recognizes that terminological fields could be set up but excludes them in his own lexicology (Coseriu and Geckeler 1974:151). A lexical gap can also be filled by a term in an unmarked sense. This is, for example, the case when Lyons introduces the superordinate term

'bilingualism' to cover both bilingualism and multilingualism.

Distributional markedness (as opposed to formal markedness in the form of modifiers or affixes) only occurs where the context clearly shows the meaning and is therefore avoided in cases where the marked and unmarked terms co-occur. Here instead it is common to insert temporary modifiers like other and ordinary, as in the combination terminological fields and other lexical fields. It should be noted that other lexical fields is not a term since it is not conventionalized and therefore does not occur as a dictionary entry. An example of a missing superordinate term not filled by an unmarked term occurs in the Salvation Army where there is no single term which covers both 'Officer' and 'Local Officer'. Instead the two terms are usually coordinated, as in Barnes 1981:14. This is also the normal way of treating the absence of a superordinate term for, for example, 'bilingualism' and 'multilingualism'.

Coseriu also claims in the quotation at the beginning of this paper that in technical usage the words are really the representatives of objects and that therefore sense and reference coincide. First of all it must here be pointed out that terms are not always secondary in relation to objects since terms can create objects. For example, J. Larochette (in Coseriu 1973:82-83) claims that every new definition of a phoneme creates a new object. Secondly, Coseriu forgets or ignores the fact that many terms have synonyms and that the relation between synonyms is one of sense not of reference, i.e. we have here cases of purely linguistic structuring. See fig. 3, which depicts the relationship between a particular machine and the two synonymous terms 'whizzer' and 'hydroextractor' used for it in engineering.

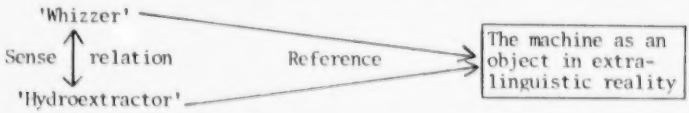

Fig. 3. Relations of sense and reference

Like other synonymous terms 'whizzer' and 'hydroextractor' have the same descriptive (or cognitive) meaning, but besides this 'whizzer' has an expressive meaning which is not present in its synonym. Moreover, if we use an intensional approach and list the set of essential properties that determine the applicability of the terms (cf. Lyons 1977:158-59), it appears that 'whizzer' explicitly mentions only an inessential property, while all the others, especially the property of extracting water, are left implicit.

Synonyms can also differ in other ways as regards explicit description of the properties of the referent. For example, both of the two linguistic syno-

nyms 'stop' and 'plosive' refer to a particular group of phonemes, but each of them describes only part of the articulatory process by which this group is formed. 'Stop' explicitly mentions only the first phase when the air-stream is blocked and 'plosive' only the second when it is released in a way resembling an explosion.

This type of intensional approach to synonymy has been given very little attention by semanticists. Its resemblance to the stylistic phenomenon called 'synechdoche' (= part for whole, e.g. sail = "ship") is obvious. Here are some further examples of synonymous terms mentioning different parts or aspects of a whole.

(1) Scouting

{(a) Scout Leader, (b) Troop Leader} — Both (a) and (b) refer to a leader of a Troop of Scouts.

(2) Psychology

{(a) 'wabbit' phenomenon, (b) 'fis' phenomenon} — Both (a) and (b) refer to a child's refusal to accept an adult's imitation of its own mispronunciation, which is exemplified by an attempt to say rabbit in (a) and fish in (b).

(3) Linguistics

{(a) Phrase-structure rule, (b) Rewrite rule, (c) Base rule} — (a) describes what the rule applies to, (b) how it is performed, and (c) where it is applied.

(4) Commerce

{(a) Landing officer, (b) Land(ing) waiter, (c) Searcher} — The reference is to a Customs official. While (a) and (b) together describe him as an officer attending to the landing of goods, (c) describes him as one who examines carefully.

(5) Electrical engineering

{(a) Contact breaker, (b) Circuit breaker} — When as (a) describes the contact is broken, then what (b) says follows, namely that the circuit is broken.

(6) Printing

{(a) Hectographic printing, (b) Gelatin printing} — While (a) says that 100 copies may be expected, (b) mentions the material used.

(7) Building

{(a) hip iron, (c) hip hook} — While (a) mentions the material, (b) describes the form.

(8) Physics

(a) E-layer (b) Heaviside layer	(a) describes the layer as electric, while (b) names one of its discoverers.

An interesting difference is exhibited by the synonyms 'column binary' and 'Chinese binary' in computer terminology. What the former says in a direct way, the latter says indirectly since Chinese symbols are read in columns.

Variation also occurs in the degrees of synonymy shown by terms. Lyons 1981:148-49 distinguishes between

(a) absolute synonymy (the same distribution and the same descriptive, expressive, and social meaning in all contexts),

(b) complete synonymy (the same descriptive, expressive, and social meaning in certain contexts),

(c) descriptive synonymy (the same descriptive meaning in certain contexts).

The first two of these types are more often to be found in terminologies than in ordinary language. Since the line between absolute and complete synonymy can hardly be drawn without comprehensive investigations of texts, the following examples are given without making a distinction between the two types: in sciences like linguistics 'cline' and 'continuum', in psychology 'biopsychics' and 'psychobiology', in nuclear engineering 'rheotron' and 'betatron' for a type of accelerator, in mathematics 'adjoint' and 'adjugate' for a square matrix where each element is replaced by its cofactor, and in medicine 'monozygotic' and 'uniovular' twins for what are called 'identical' twins in ordinary language.

Some synonyms have a transparent, others an opaque sense (cf. Ullmann 1964, Ch. 4). For example, while it is quite clear what 'nightblindedness' and 'dayblindedness' mean, the synonymous, more "learned", terms 'nyctalopia' and 'hemeralopia' are often confused with each other, even in encyclopedias, e.g. Eysenck et al. 1972.

In some cases opinions vary as to whether two terms are synonymous or co-hyponyms differing in sense. For example, the mathematical terms 'regular function' and 'analytic function' can both refer to a function of a complex variable differentiable at all points, but 'analytic function' is sometimes used to refer to a function of a complex variable differentiable in all except a finite number of points. Similarly, 'ice-cap' is regarded by some geographers as synonymous with 'ice sheet' and by others considered to apply only to smaller masses of ice and snow.

Markedness and synonymy are not the only areas in which interesting things can be said about the semantic relations of terms. The same term can refer to

different objects or events in extralinguistic reality and we then speak of homonymy or polysemy. The difference between homonymous and polysemous terms is that the former have unrelated and the latter related meanings. Homonymous terms are rare, one example being 'temporal', which can refer either to time or to location at the temples (sides of the brow). Since these homonyms are used in different sciences, they are hardly likely to cause confusion. Unlike homonymous terms, polysemous terms are very frequent. The most common type of polysemy is when the same term is used in specific senses in different terminologies. For example, 'assimilation' has developed specific senses in sociology, physiology, psychology, and phonetics. Similarly, 'activator' has specific senses in bacteriology, biochemistry, mineral processing, physics, and zoology. Polysemy in the same field may be exemplified by 'active materials', which is ambiguous in the science of electricity and electronics between "essential materials required for the functioning of a device" and "all types of radioactive materials".

In the terminology of Scouting some interesting cases of structural ambiguity in compound terms can be found. Thus 'Boy Scout Leader' can denote either a Scout Leader who is a boy or a leader of Boy Scouts. Here disambiguation takes place in the pronunciation since in the first case one says "Boy Scoutleader", in the second "Boyscout Leader". However, the term 'Explorer Leader' is pronounced the same way whether it means "a leader who is an Explorer" or " a leader of Explorers".

One difference between terms and ordinary lexemes is that a very large percentage of all terms are phrasal. Lyons 1977:545ff discusses some cases where in ordinary language the meaning of the modifier or the head of a phrasal lexeme has no influence on the meaning of the whole. For instance, in British English 'public school' actually refers to a private school, and 'public house' is not a hyponym of 'house'. Similar cases can be found in terminologies. For example, the term 'Boy Scout' is easily taken by outsiders to apply to all the boys who are members of the Boy Scouts of America. However, this is wrong for it only applies to one age-group and not, for example, to younger members like the Cub Scouts, although these are also boys. This illogicality can be explained on historical grounds. Originally the Boy Scouts of America had only the age-group now called 'Boy Scouts' and when other age-groups were added it simply retained its name. Moreover, the term 'Senior Patrol Leader' is misleading since the boy who holds the position it denotes is not a patrol leader but the key junior leader at the troop level. This term, again, has an historical explanation. In the early days of Scouting one of the older patrol leaders was chosen for this position and for a

time combined his work at the troop level with that of being a patrol leader. Retention of an originally appropriate term also explains why theatres and concert-halls can have a 'greenroom' that is not painted green. In mineralogy the term 'black opal' includes all opals of dark taint, even the fine Australian 'black opal', which is actually blue. Similarly, in metereology what is called 'black frost' is seldom really black since it is simply an air frost with no deposit of hoar frost. The wood that in forestry is called 'Cuban mahogany' comes not only from the West Indies but also from Florida and the cotton that in the textile industry is termed 'China Cotton' is not grown only in China but also in Thailand. In chemistry the term 'dry ice' does not refer to ice but to frozen carbon dioxide, and though the materials called 'plastics' are only plastic under heat and pressure, they retain their name also in other cases.

What is included under a superordinate term is sometimes arbitrary, depending totally on definition. For example, in the Salvation Army a Corps Officer is an officer, i.e. one who is employed in full-time service, but a Local Officer is not an officer since he or she is an unpaid volunteer (Salvation Army Year Book 1981:32-33). Moreover, if we had expected terminologies to render part-whole relations explicitly, then British Scouting would have used the terms 'Patrol Leader', 'Troop Leader', and 'Group Leader' for the leaders in charge of various units since a patrol is part of a troop and a troop is part of a group. However, the actual terms are 'Patrol Leader', 'Scout Leader', and 'Group Scout Leader'.

According to other statements by Coseriu ordinary language does not only choose distinctions which coincide with boundaries or relations in extralinguistic reality but also establishes boundaries and relations which do not exist there, i.e. human interpretation of reality imposes, via language, its own structuring on reality (Coseriu and Geckeler 1974:142). Though this is less common in terminologies, examples can certainly be found there too. For example, we can set up a continuum of such objects as 'boulder' - 'cobble' - 'pebble'. In ordinary language people give each of these a prototypical sense, i.e. they have a good conception of what is a typical boulder, cobble, or pebble, but hesitate as regards borderline cases (cf. Lyons 1981: 316). In geology the vagueness has been replaced by specification of diameters. However, the linguistic nature of this specification appears from the fact that one system of classification distinguishes only between boulders and pebbles and sets the line at 100 mm, whereas another recognizes boulders, cobbles, and pebbles and sets the lines at, respectively, 256 mm and 64 mm (Collocott-Dobson 1974). Lower down the same continuum 'gravel',

'sand', 'silt', and 'clay' are distinguished, and here too, the borderlines differ. For instance, what is called 'sand' in one system is partly covered by what is called 'coarse silt' in the other. This may be compared with the different ways into which the colour spectrum is divided up by different languages. In child psychology, there is no agreement as regards the line between the main periods into which childhood can be divided. The first period is called 'infancy' and the second 'childhood proper' or 'childhood' (in a marked sense). This second period is said by some to begin with the onset of speech about the age of 1, by others with the beginning of the first defiance period at the age of 3 to 4 (Eysenck et al. 1972). Drever 1964 refers to no such change in a child's development, i.e. in extralinguistic reality, but simply states that infancy is "usually taken to cover the first two years of life".

Relationships like big/little, which according to Coseriu do not as such exist in extralinguistic reality, are established not only in ordinary language but also to some extent in terminologies. This may be exemplified by the following prefix pairs, which also illustrate that not only synonyms but also antonyms are frequent in terminologies:

macro-/micro- (= big/little), e.g. 'macrocosmos', 'microcosmos';
eu-/dys- (= good/bad), e.g. 'euphoria', 'dysphoria';
poly-/oligo- (= many/few), e.g. 'polypod', 'oligopod';
neo-/paleo- (= new/old), e.g. 'neolithic', 'paleolithic';
hyper-/hypo- (= too much/too little), e.g. 'hyperacidity', 'hypoacidity'.

I hope that this paper has shown that terminologies are far from semantically uninteresting but offer the linguist many noteworthy phenomena to analyze and classify. It is very essential in my opinion that linguists are invited to take an active part in discussions on the introduction or change of terms in various areas of science and culture. A prerequisite for that is of course that linguists do not by self-imposed restrictions cut themselves off from research within this important sector of vocabulary.

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